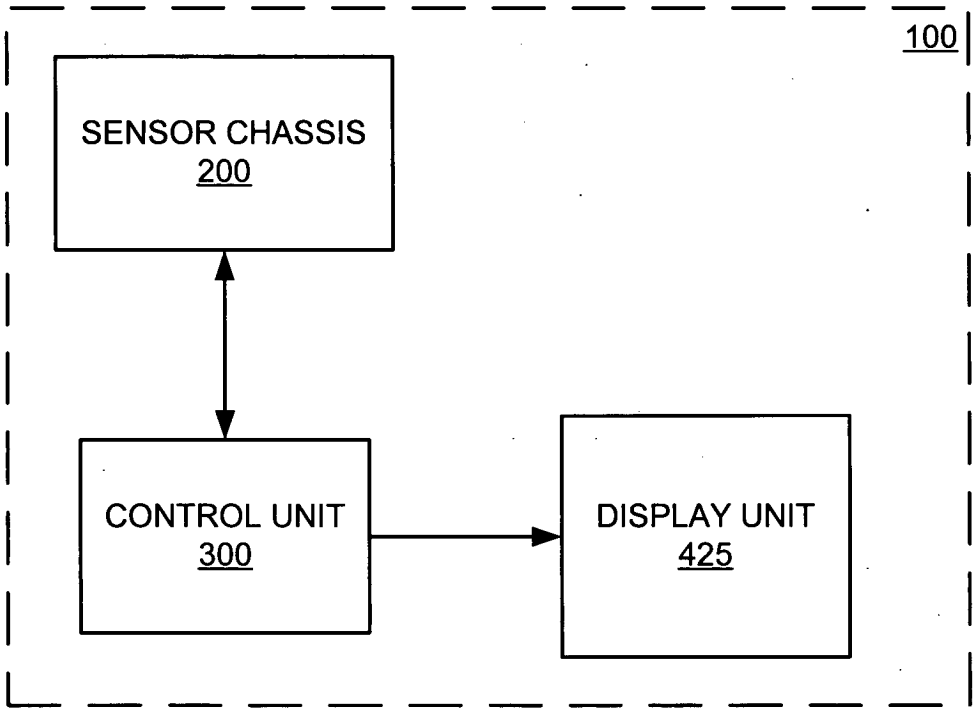


FIG. 1A

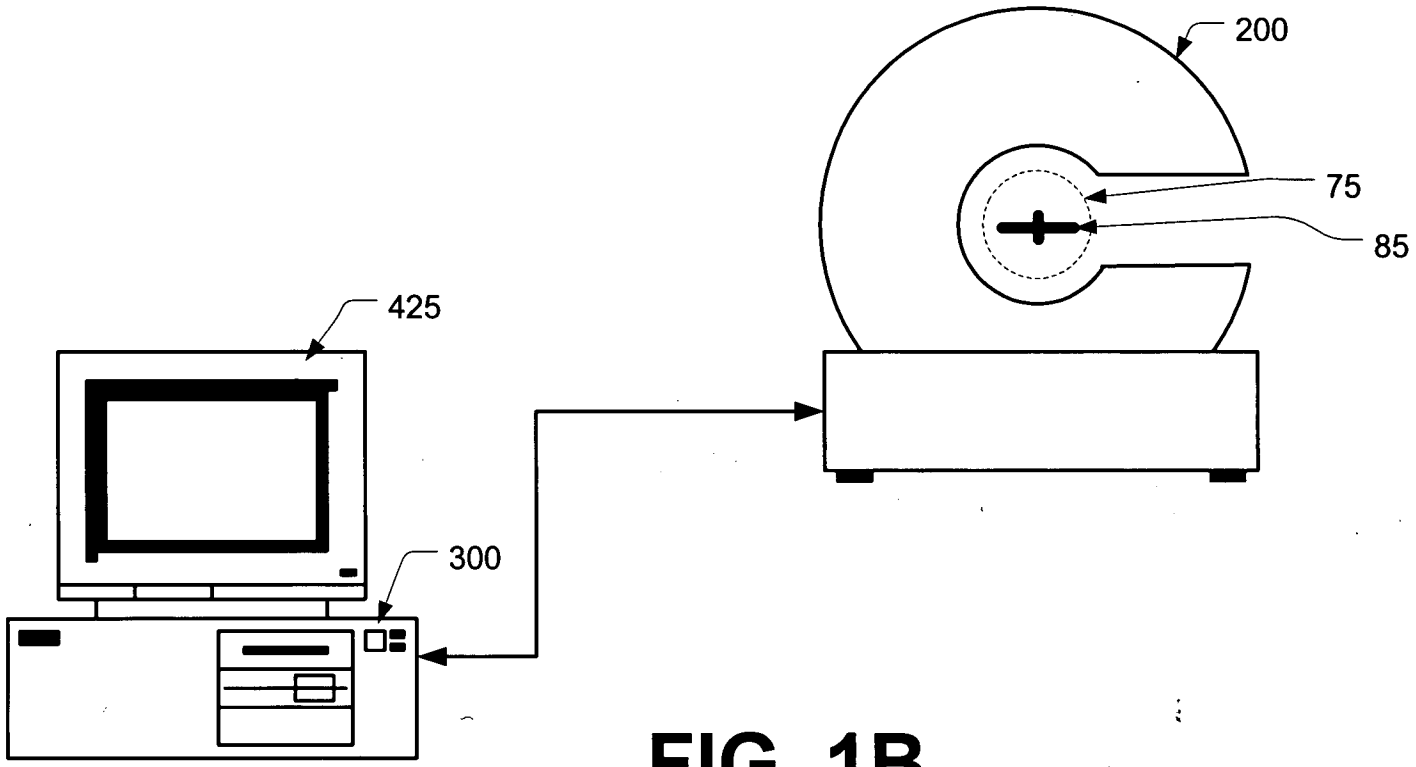


FIG. 1B

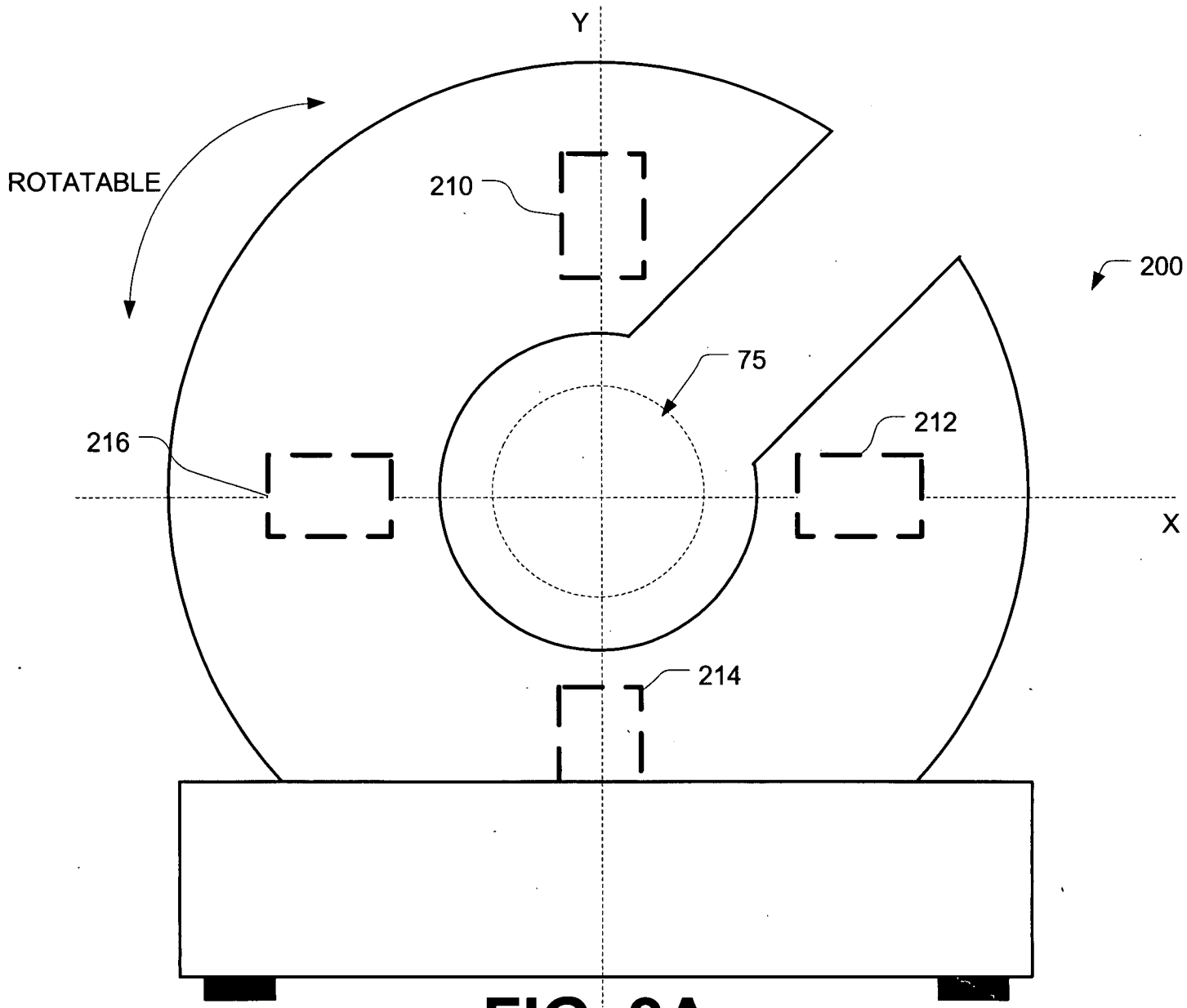


FIG. 2A

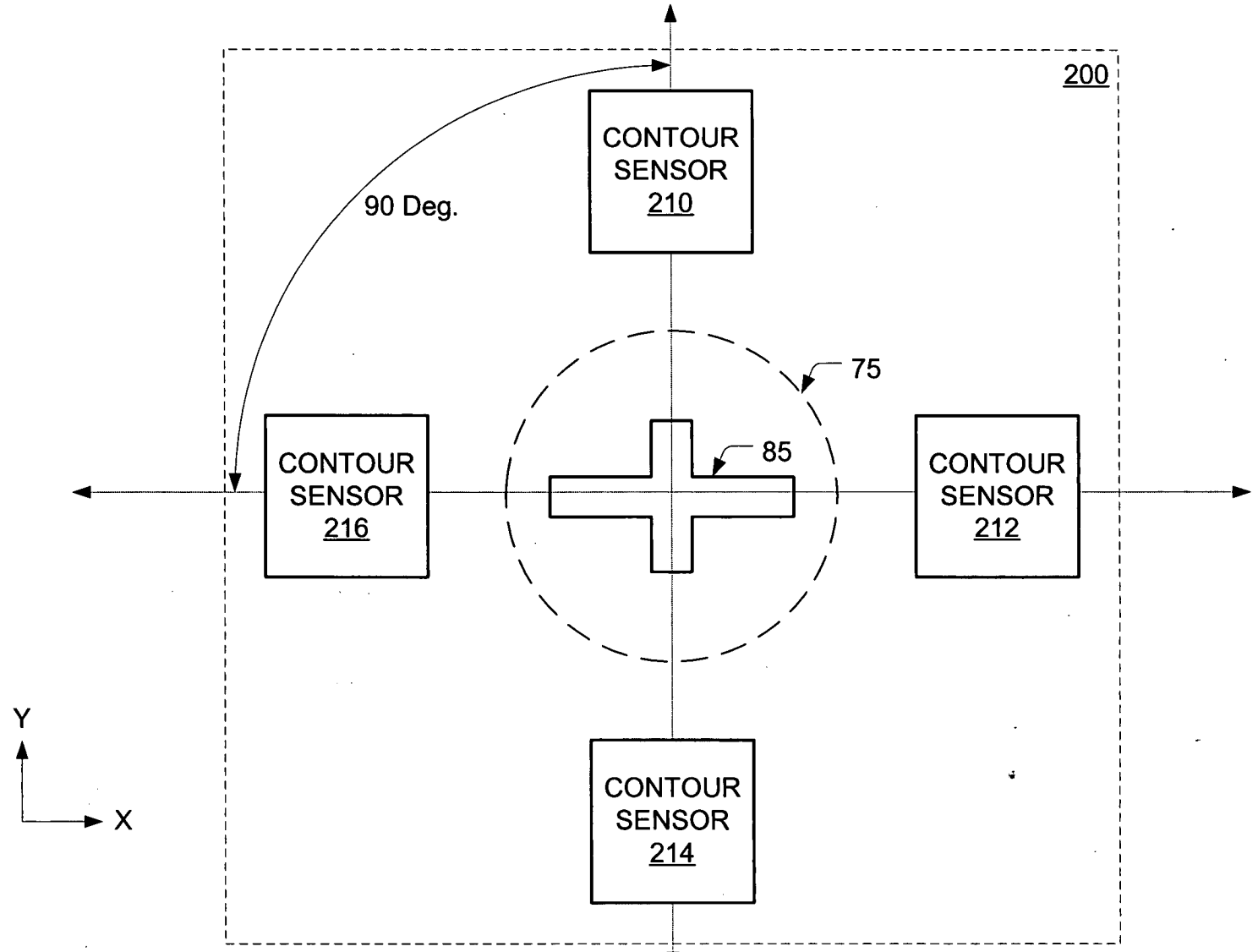

200
CONTOUR SENSOR 210
90 Deg.
75
85
CONTOUR SENSOR 216
CONTOUR SENSOR 212
CONTOUR SENSOR 214
Y
X

FIG. 2B

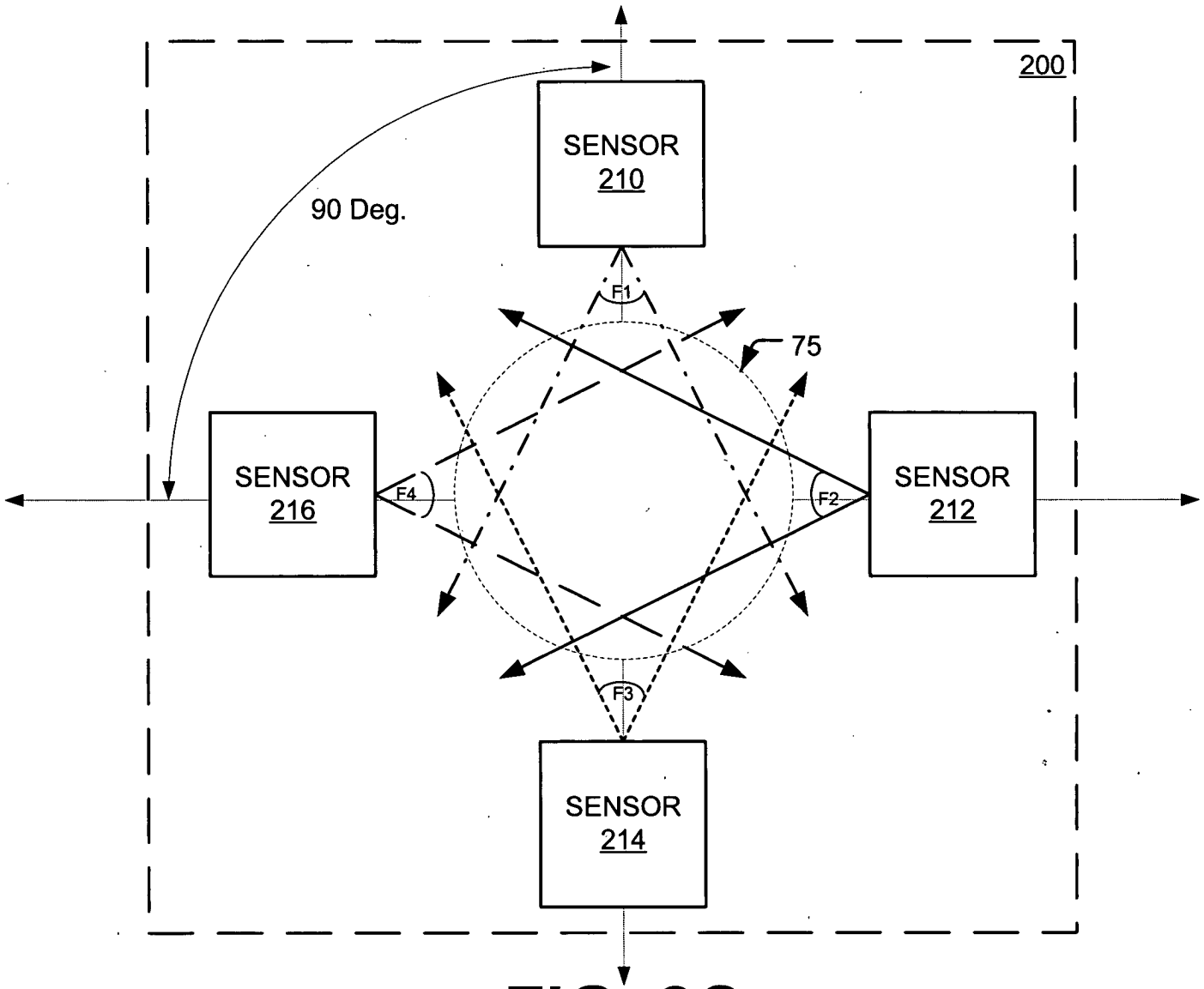

200
SENSOR
210
90 Deg.
F1
75
SENSOR
216
F4
F2
SENSOR
212
F3
SENSOR
214

FIG. 2C

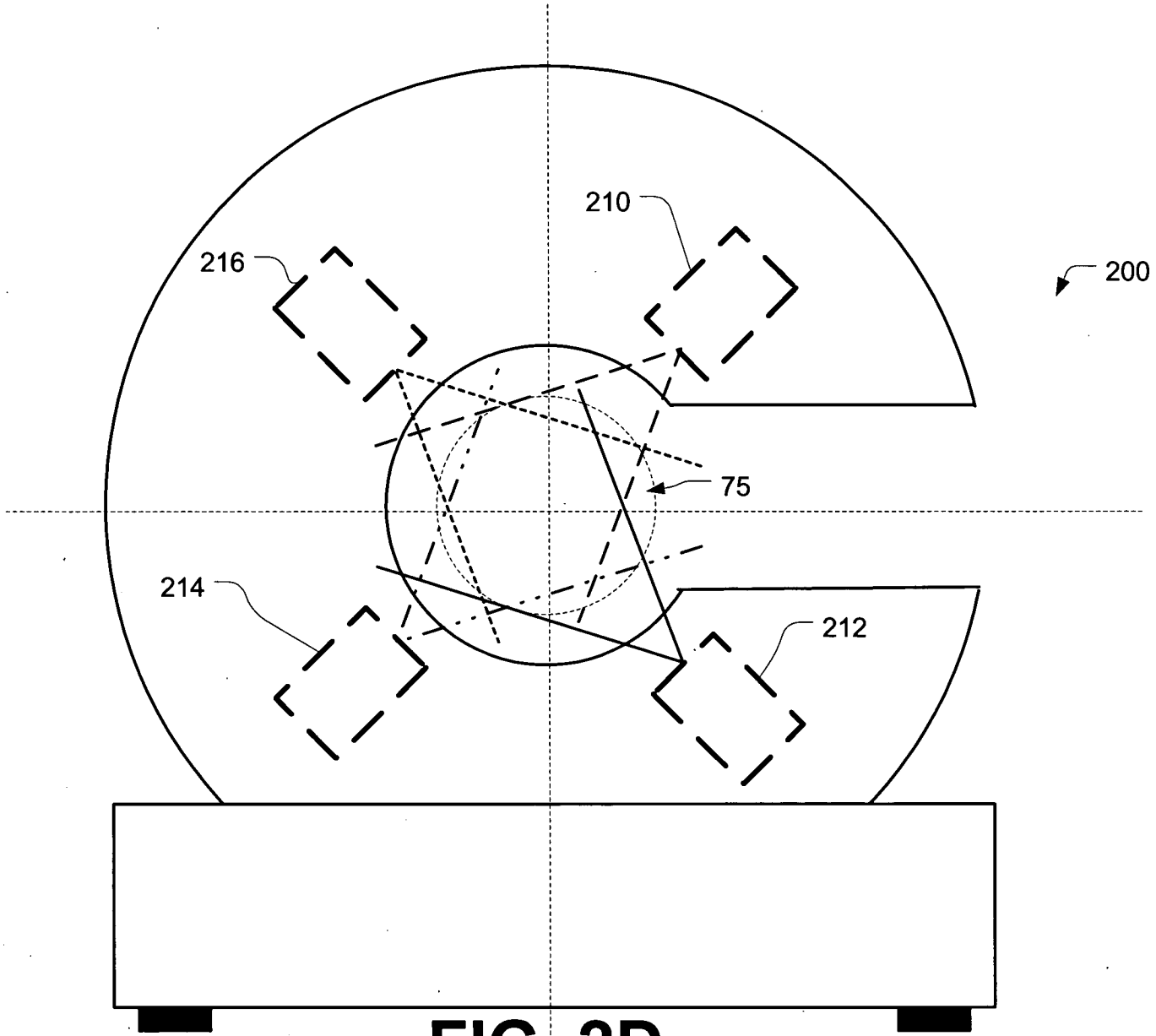


FIG. 2D

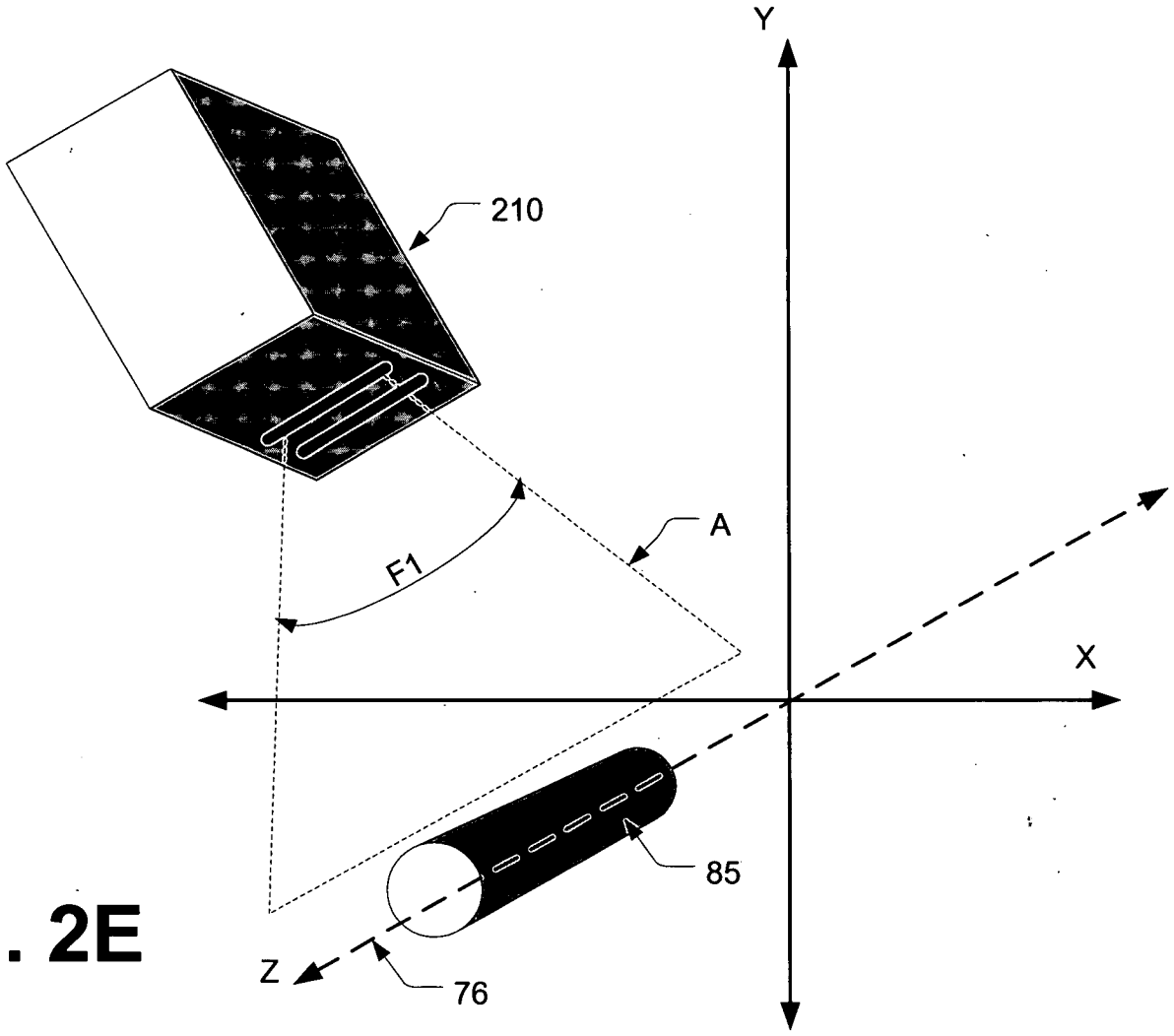


FIG. 2E

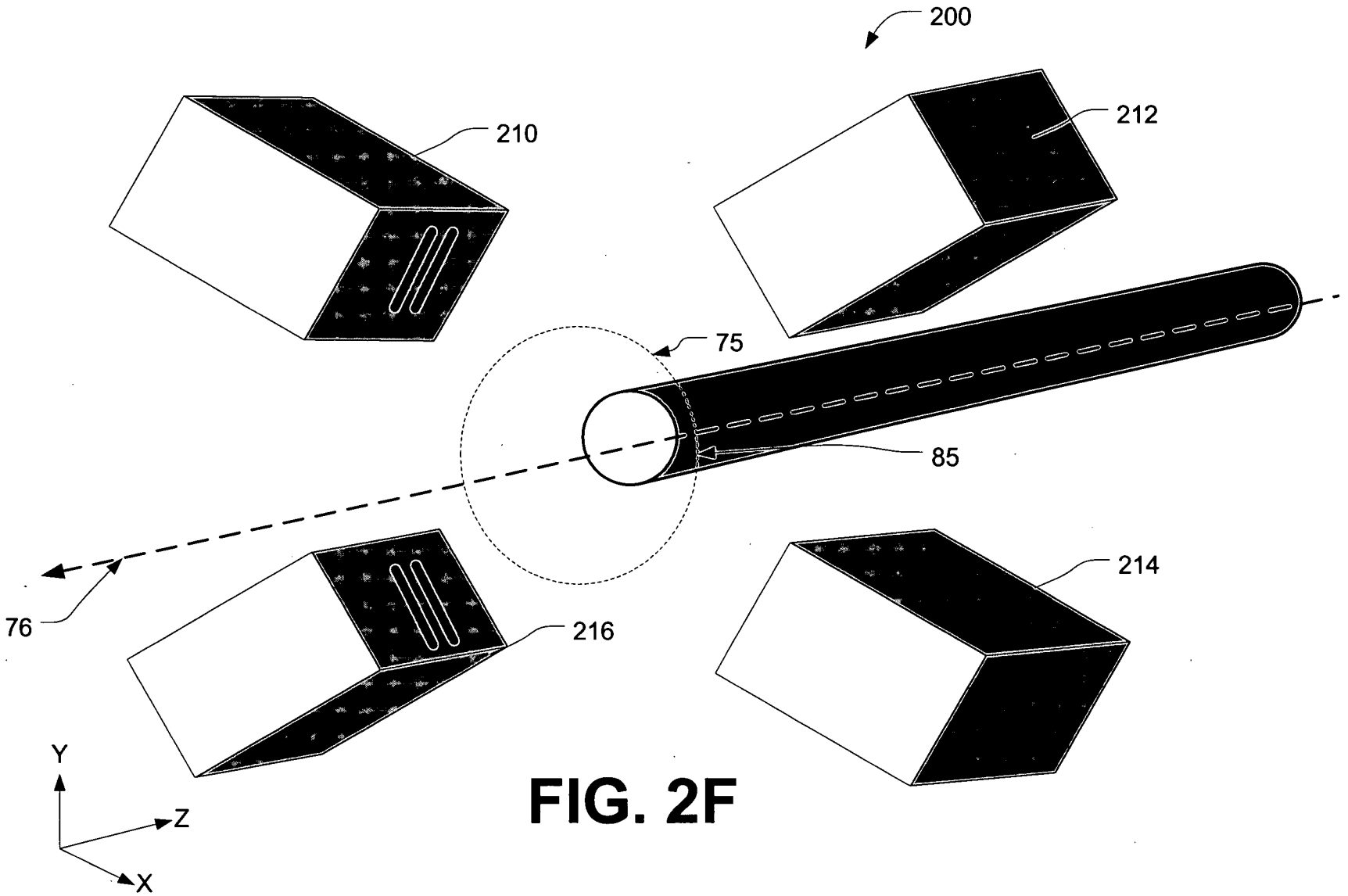
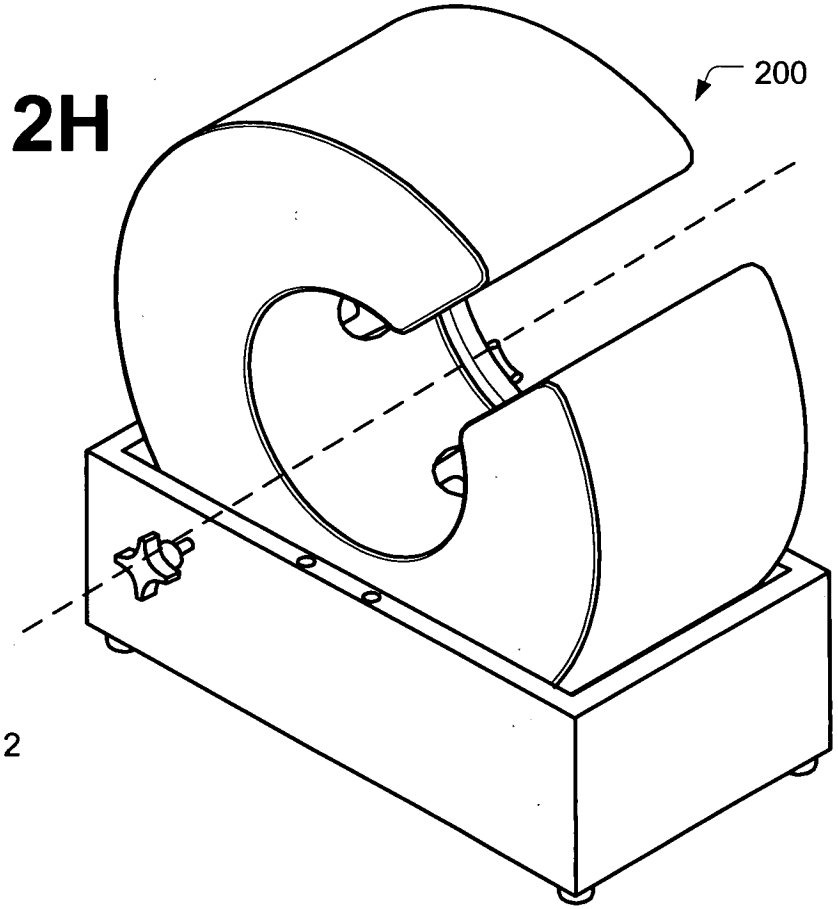


FIG. 2F

FIG. 2H



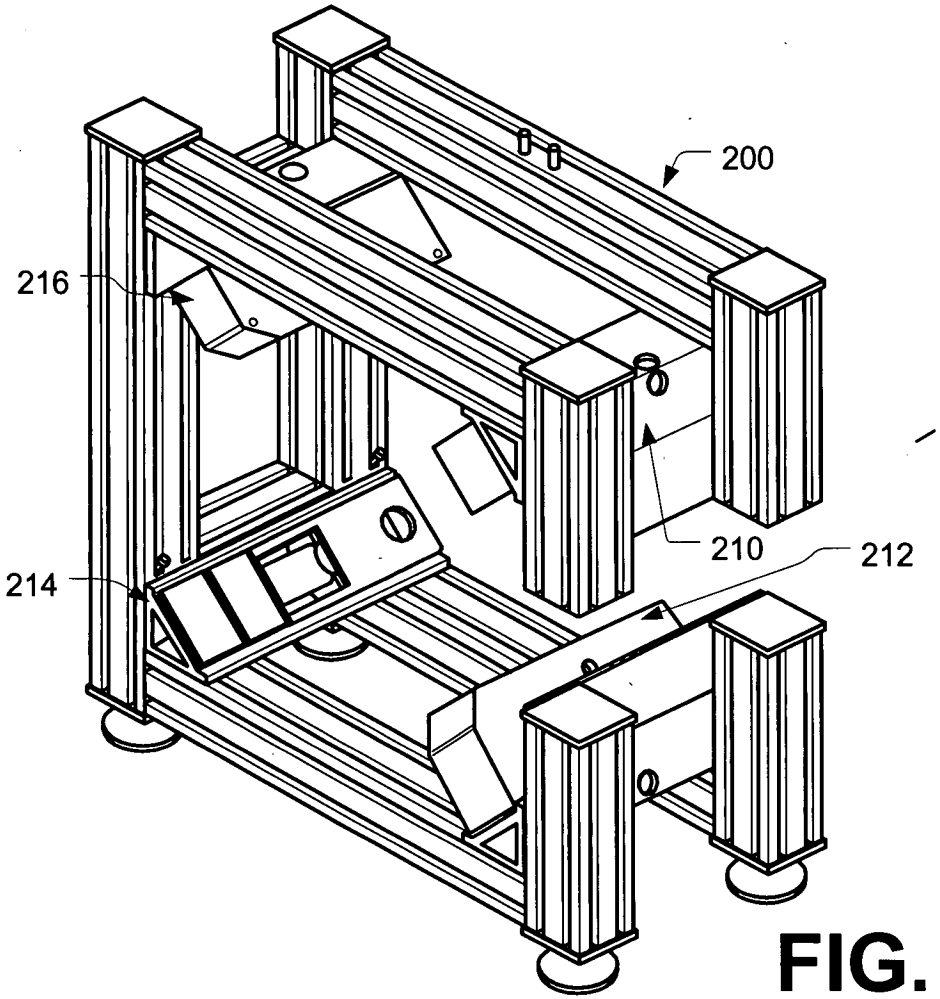


FIG. 2G

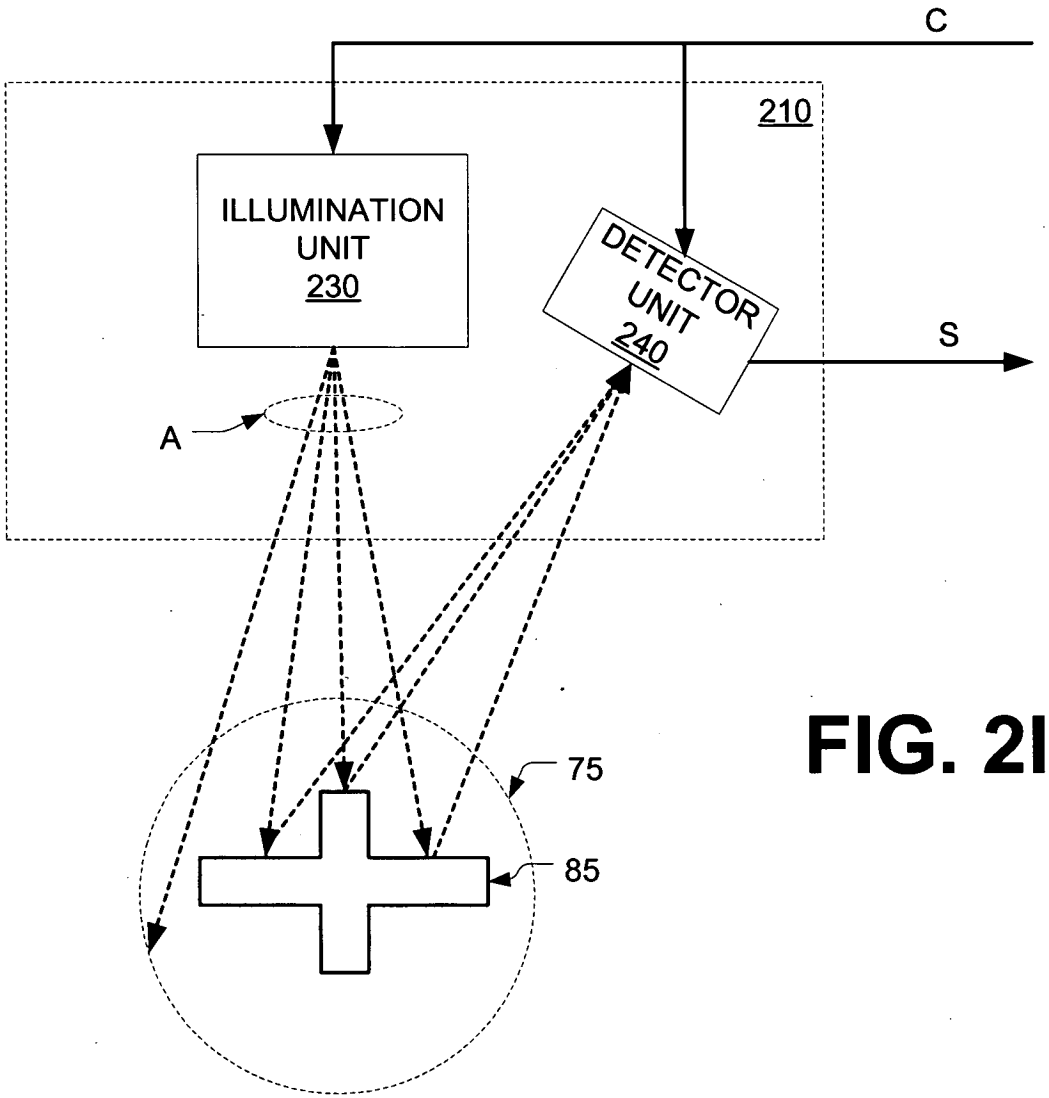


FIG. 2I

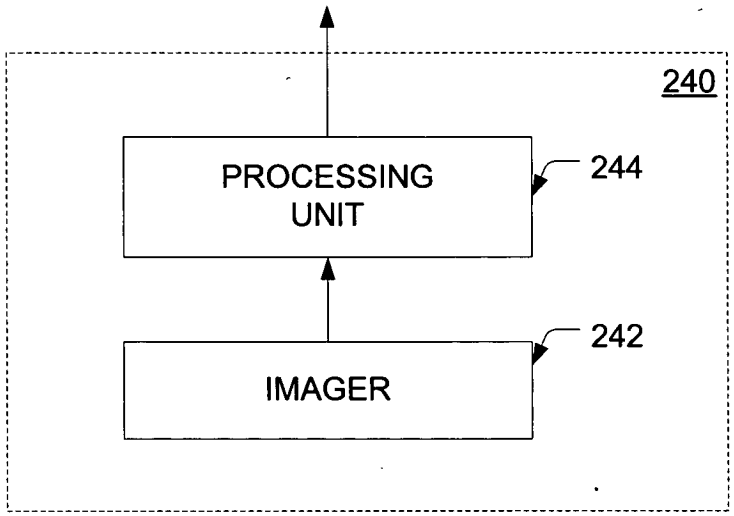


FIG. 2J

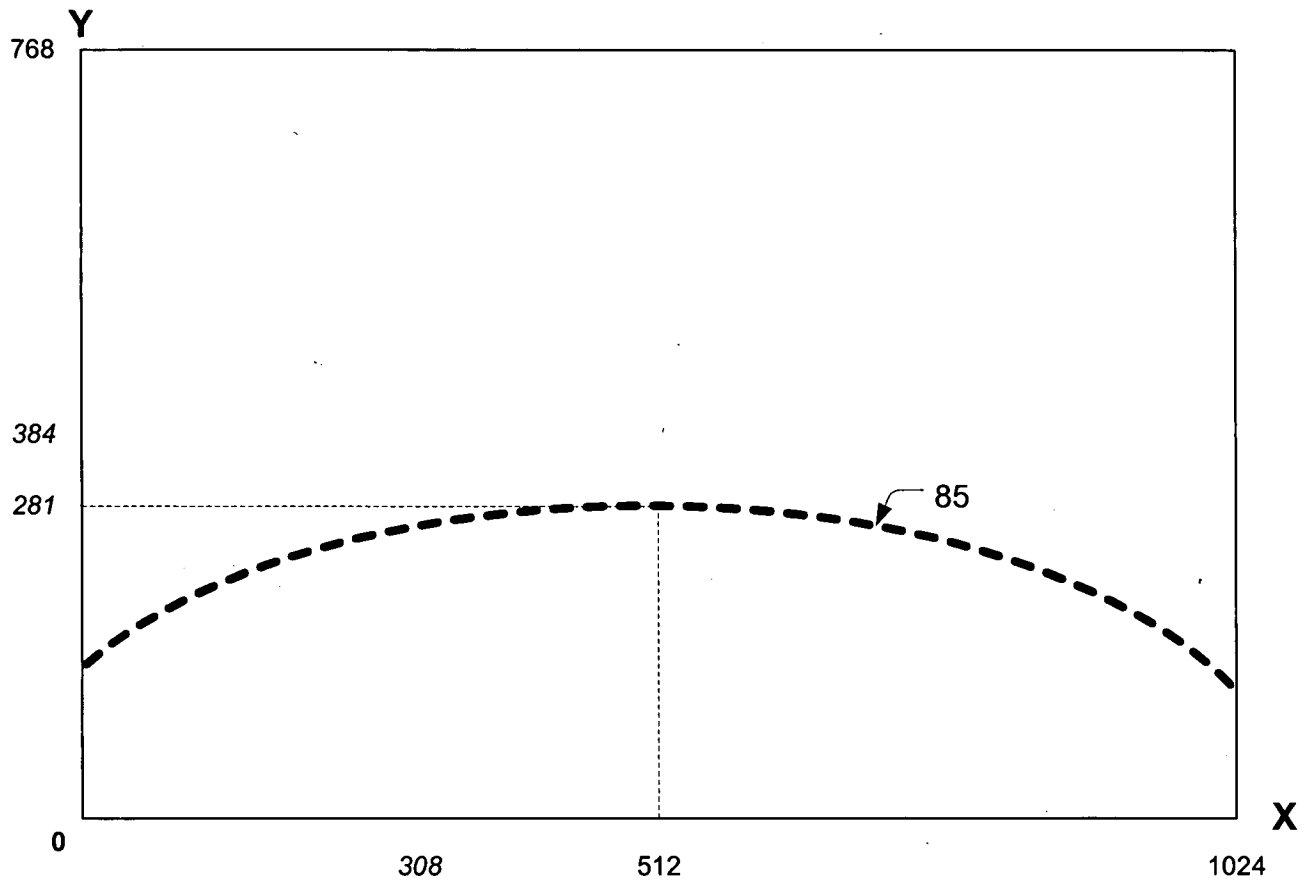


FIG. 2K

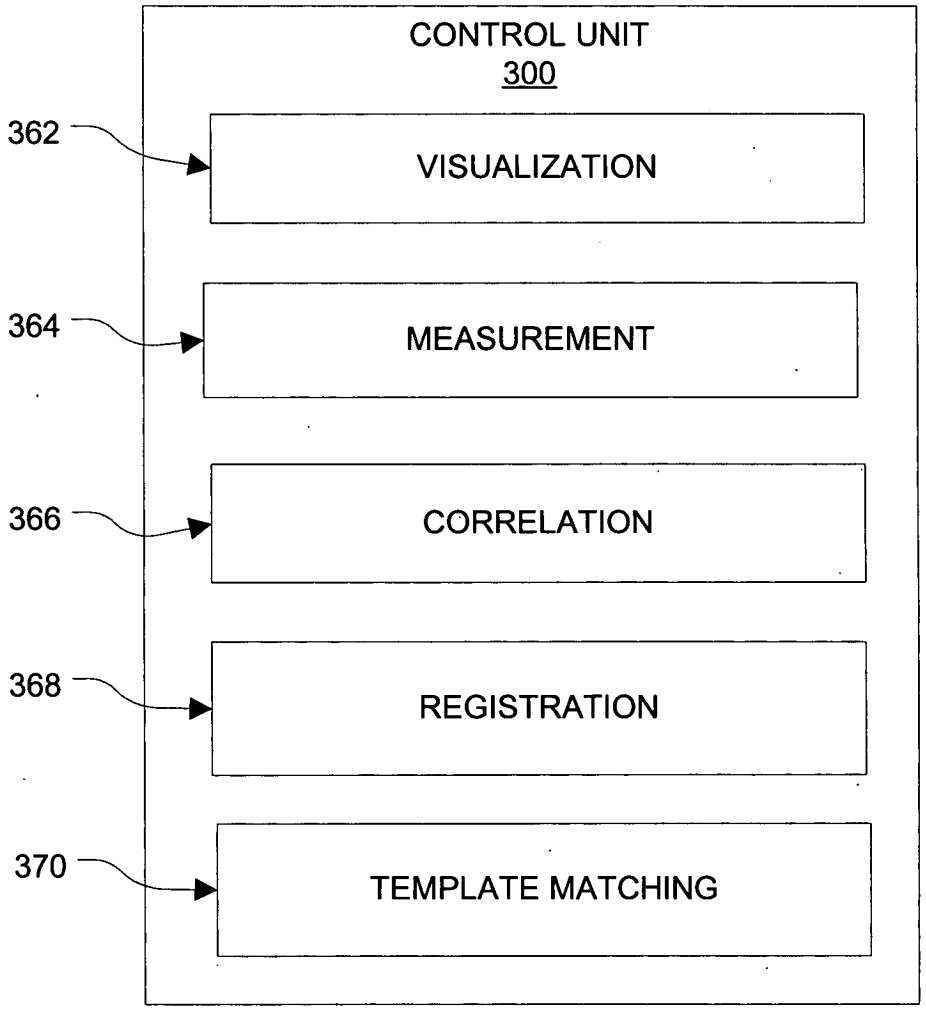

CONTROL UNIT
300
362
VISUALIZATION
364
MEASUREMENT
366
CORRELATION
368
REGISTRATION
370
TEMPLATE MATCHING

FIG. 3A

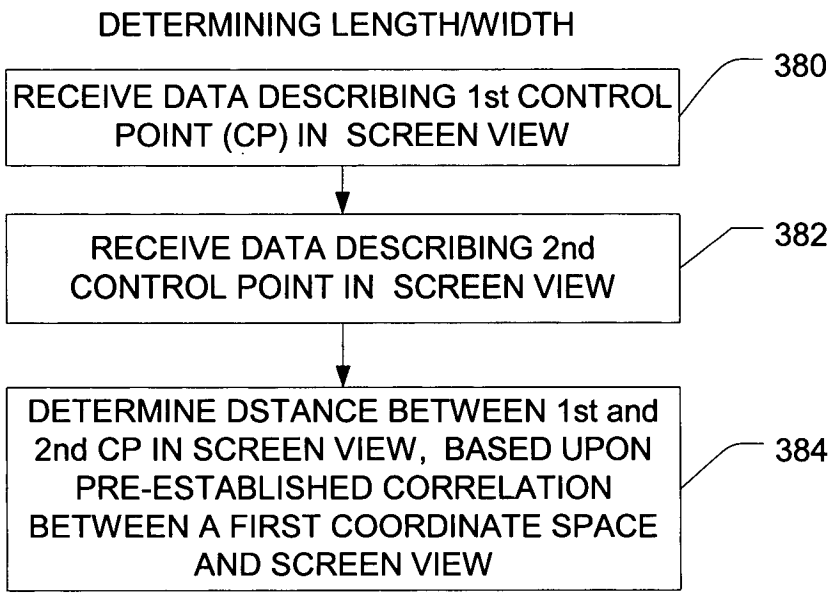

DETERMINING LENGTH/WIDTH
RECEIVE DATA DESCRIBING 1st CONTROL POINT (CP) IN SCREEN VIEW
380
RECEIVE DATA DESCRIBING 2nd CONTROL POINT IN SCREEN VIEW
382
DETERMINE DSTANCE BETWEEN 1st and 2nd CP IN SCREEN VIEW, BASED UPON PRE-ESTABLISHED CORRELATION BETWEEN A FIRST COORDINATE SPACE AND SCREEN VIEW
384

FIG. 3B

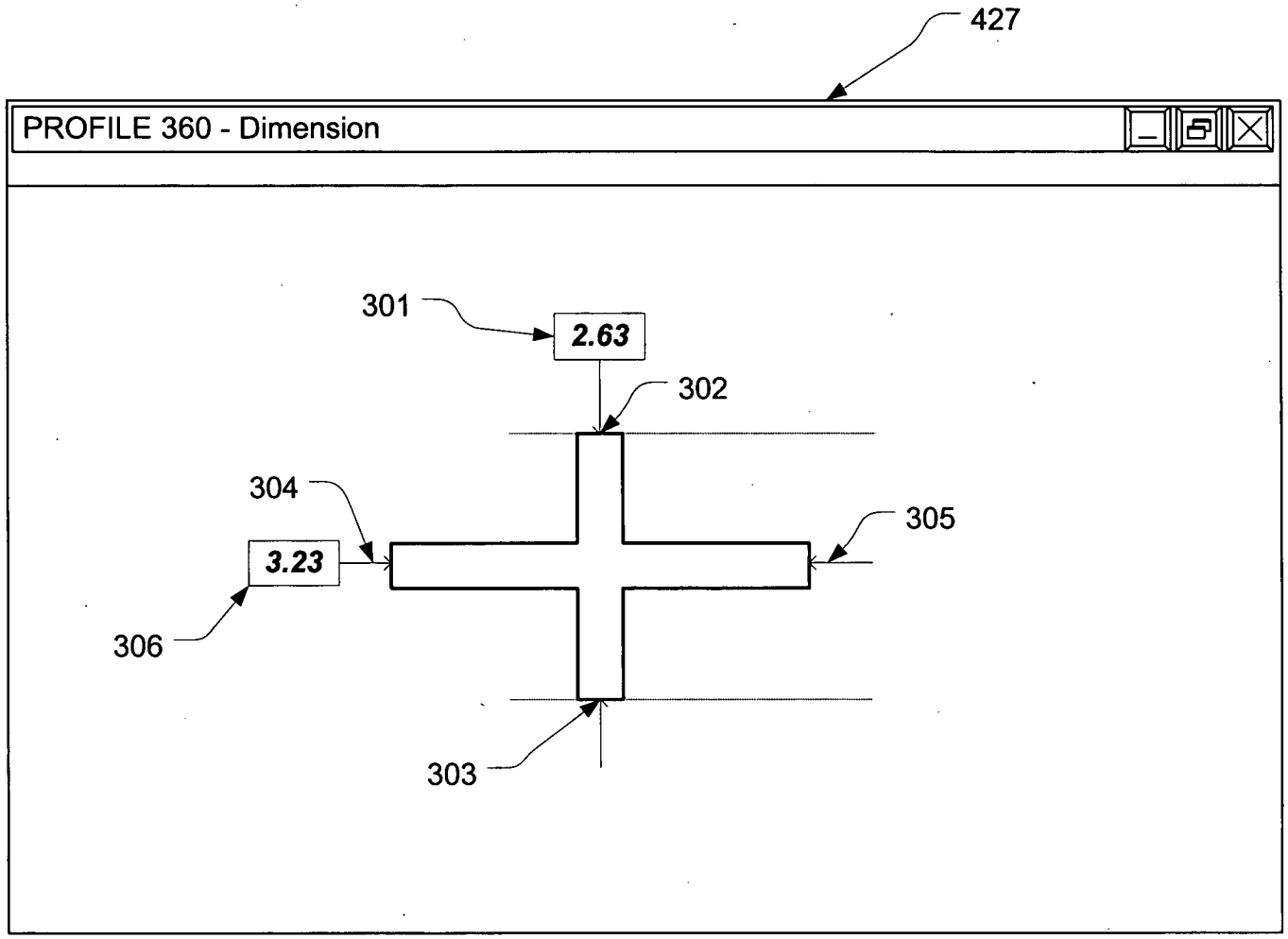


FIG. 3C

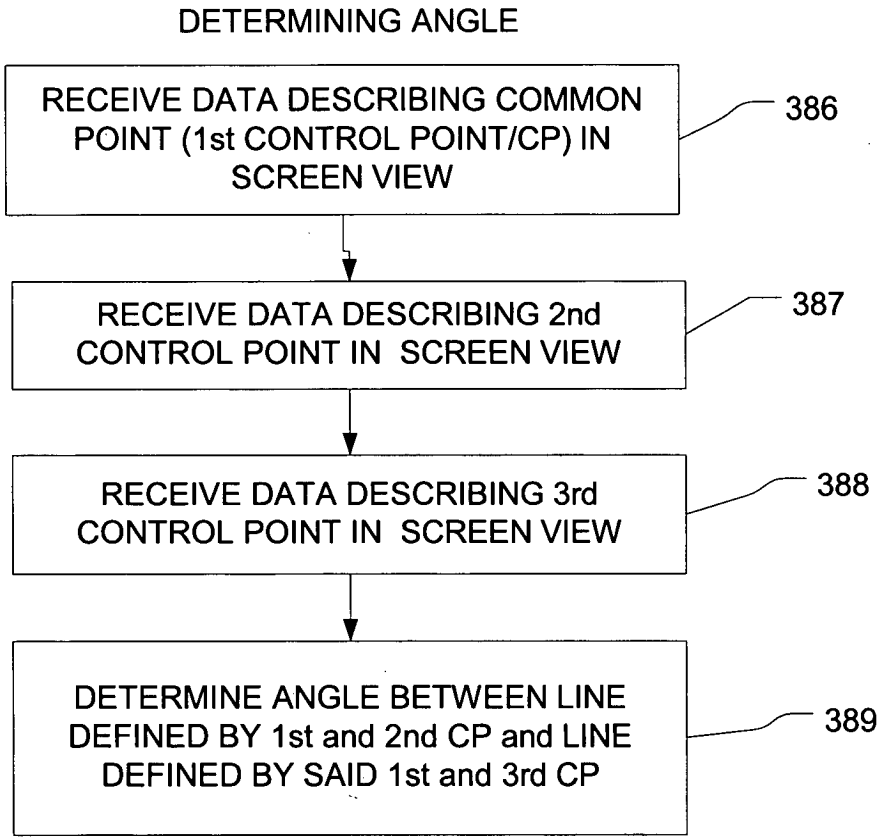

DETERMINING ANGLE
RECEIVE DATA DESCRIBING COMMON POINT (1st CONTROL POINT/CP) IN SCREEN VIEW
386
RECEIVE DATA DESCRIBING 2nd CONTROL POINT IN SCREEN VIEW
387
RECEIVE DATA DESCRIBING 3rd CONTROL POINT IN SCREEN VIEW
388
DETERMINE ANGLE BETWEEN LINE DEFINED BY 1st and 2nd CP and LINE DEFINED BY SAID 1st and 3rd CP
389

FIG. 3D

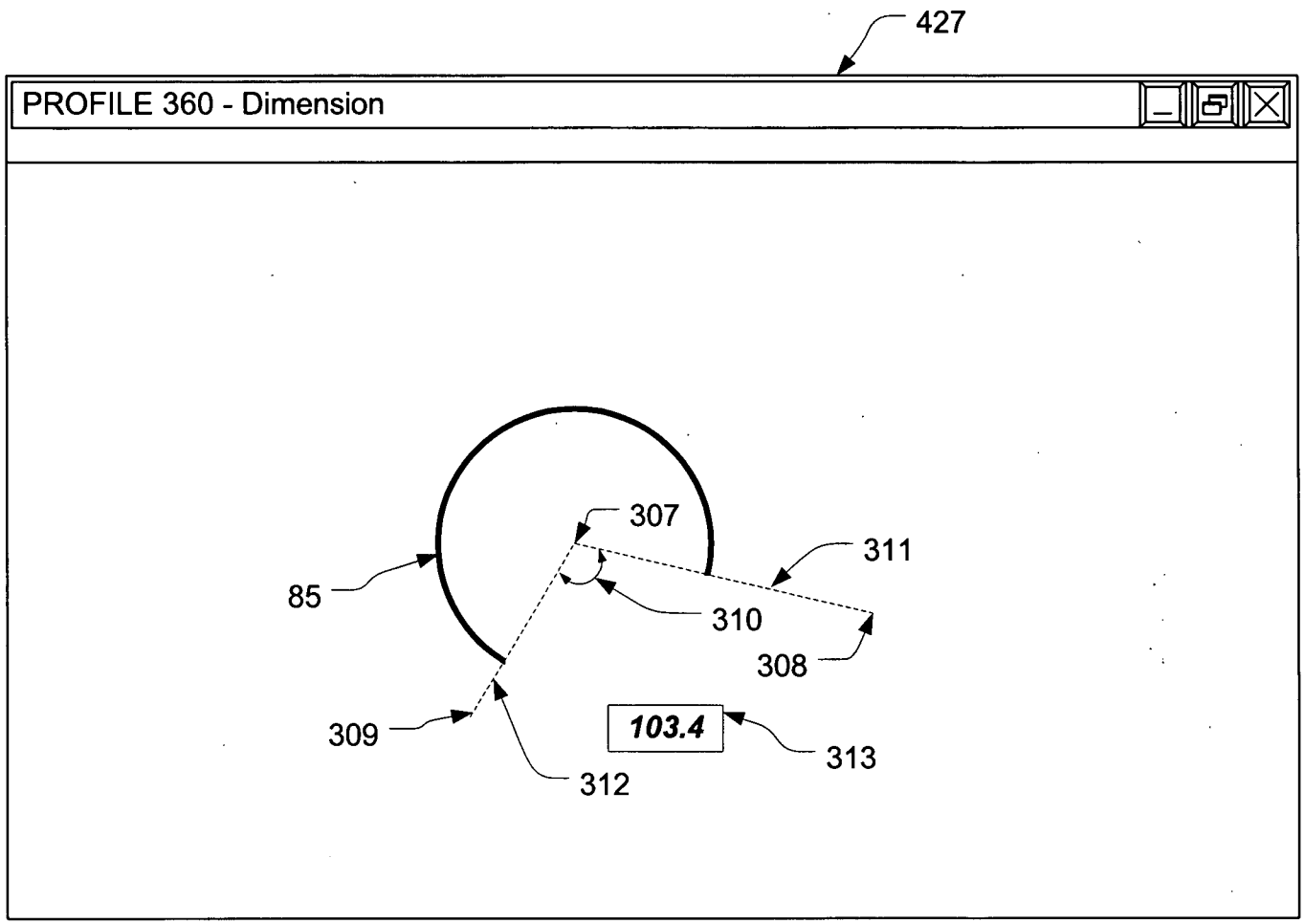


FIG. 3E

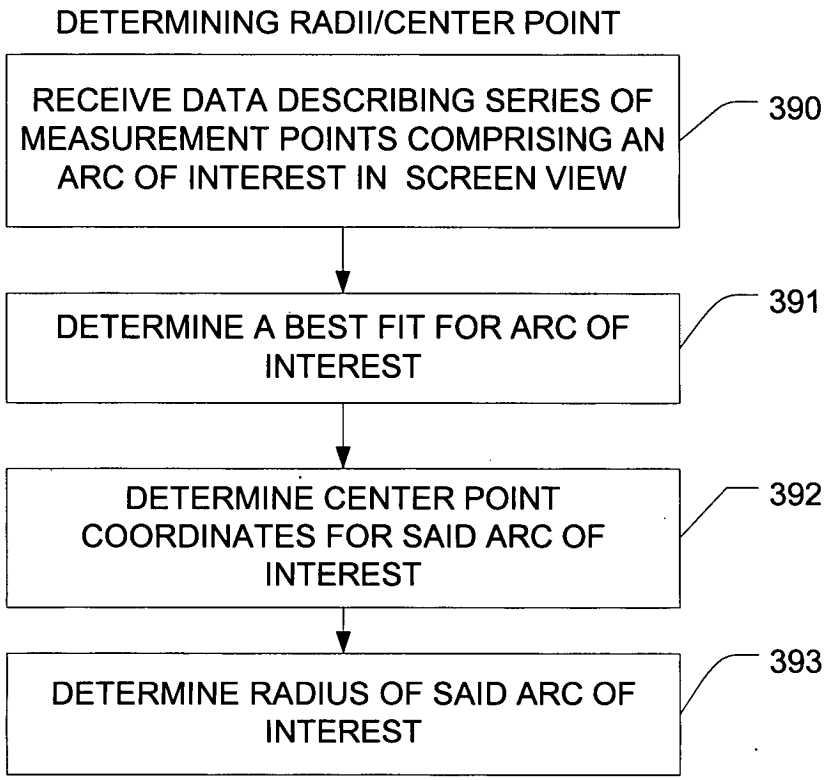

DETERMINING RADII/CENTER POINT
RECEIVE DATA DESCRIBING SERIES OF MEASUREMENT POINTS COMPRISING AN ARC OF INTEREST IN SCREEN VIEW
390
DETERMINE A BEST FIT FOR ARC OF INTEREST
391
DETERMINE CENTER POINT COORDINATES FOR SAID ARC OF INTEREST
392
DETERMINE RADIUS OF SAID ARC OF INTEREST
393

FIG. 3F

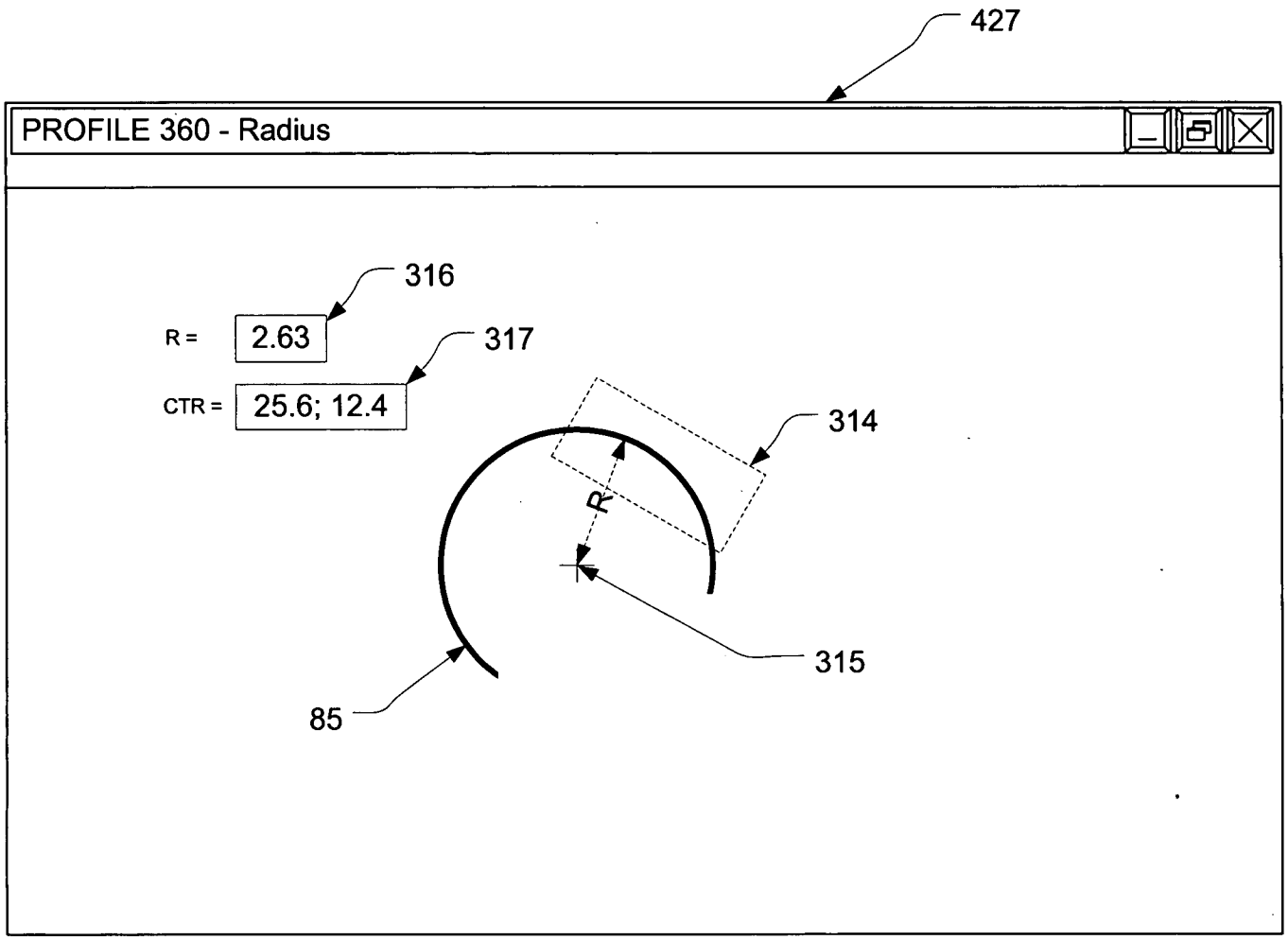


FIG. 3G

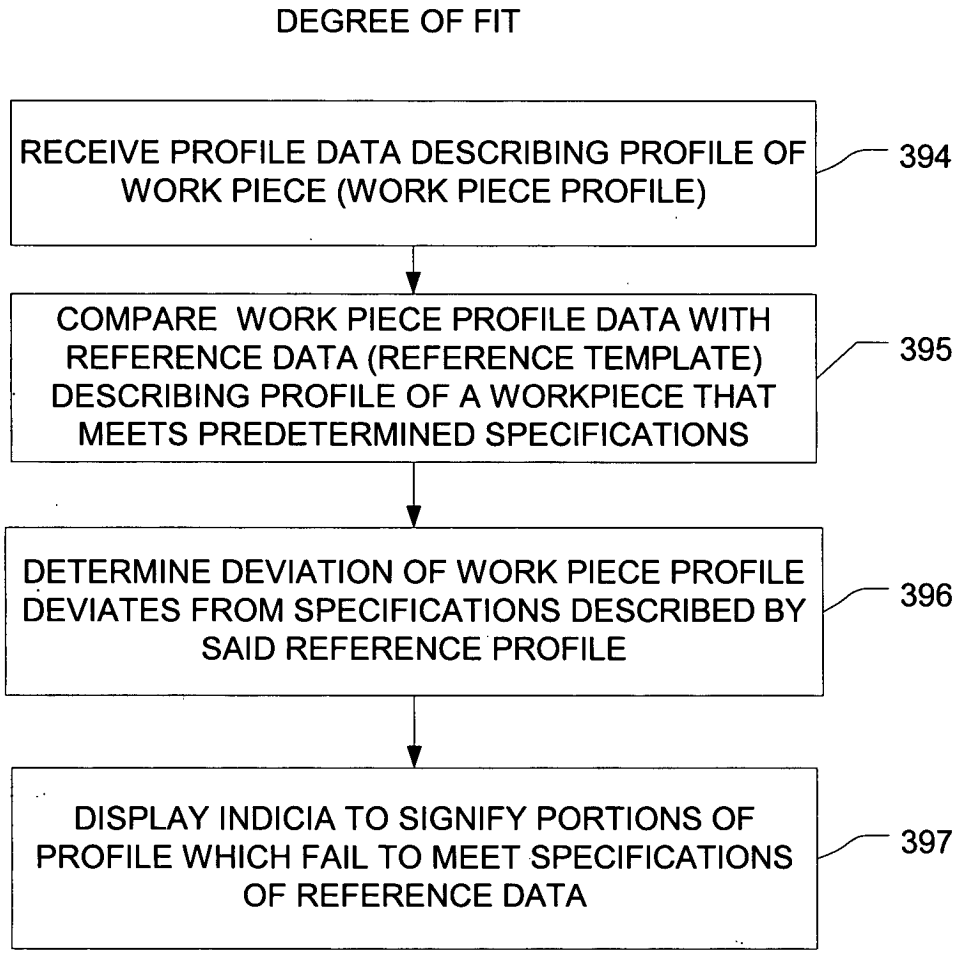

DEGREE OF FIT
RECEIVE PROFILE DATA DESCRIBING PROFILE OF WORK PIECE (WORK PIECE PROFILE)
394
COMPARE WORK PIECE PROFILE DATA WITH REFERENCE DATA (REFERENCE TEMPLATE) DESCRIBING PROFILE OF A WORKPIECE THAT MEETS PREDETERMINED SPECIFICATIONS
395
DETERMINE DEVIATION OF WORK PIECE PROFILE DEVIATES FROM SPECIFICATIONS DESCRIBED BY SAID REFERENCE PROFILE
396
DISPLAY INDICIA TO SIGNIFY PORTIONS OF PROFILE WHICH FAIL TO MEET SPECIFICATIONS OF REFERENCE DATA
397

FIG. 3H

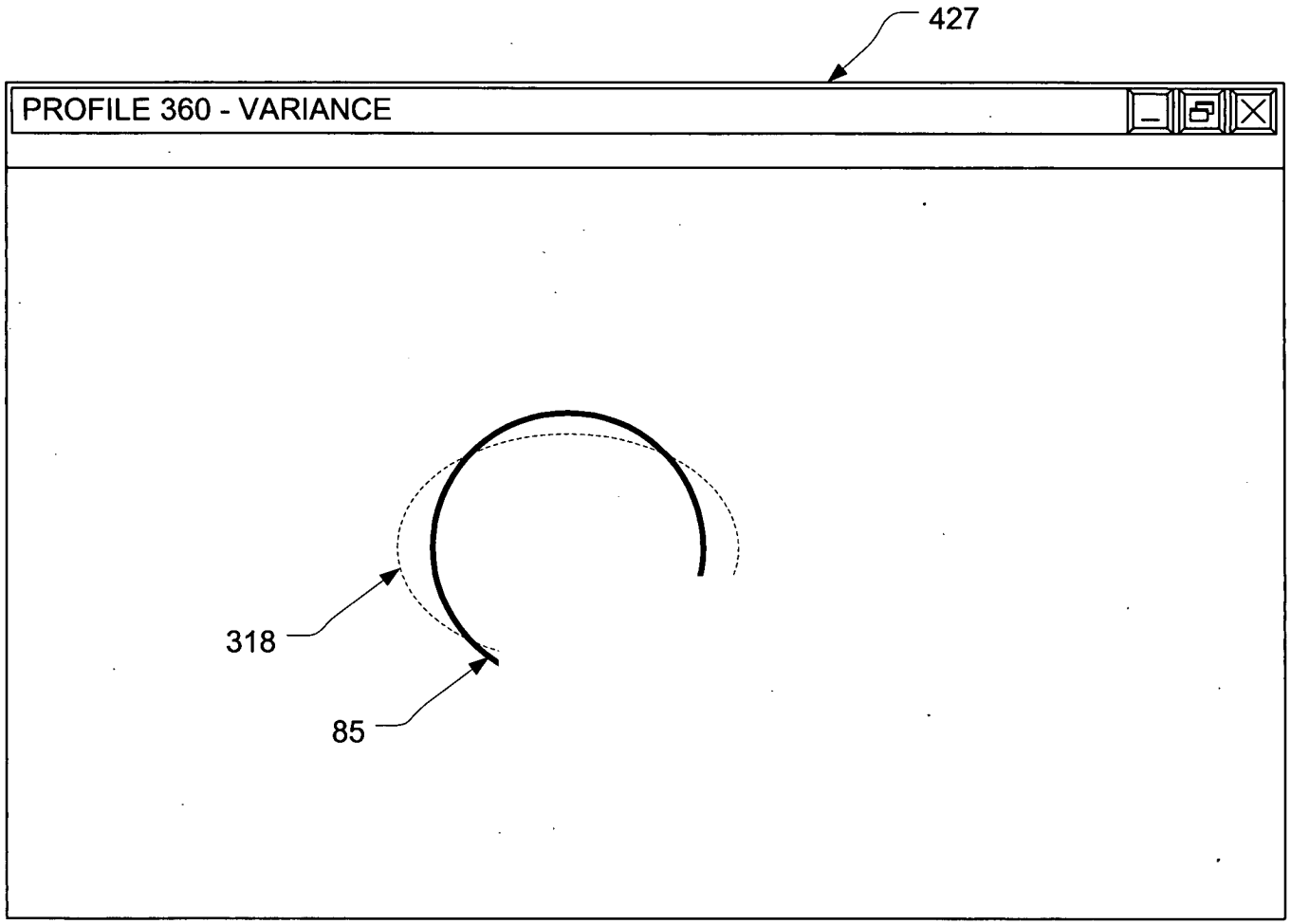


FIG. 3I

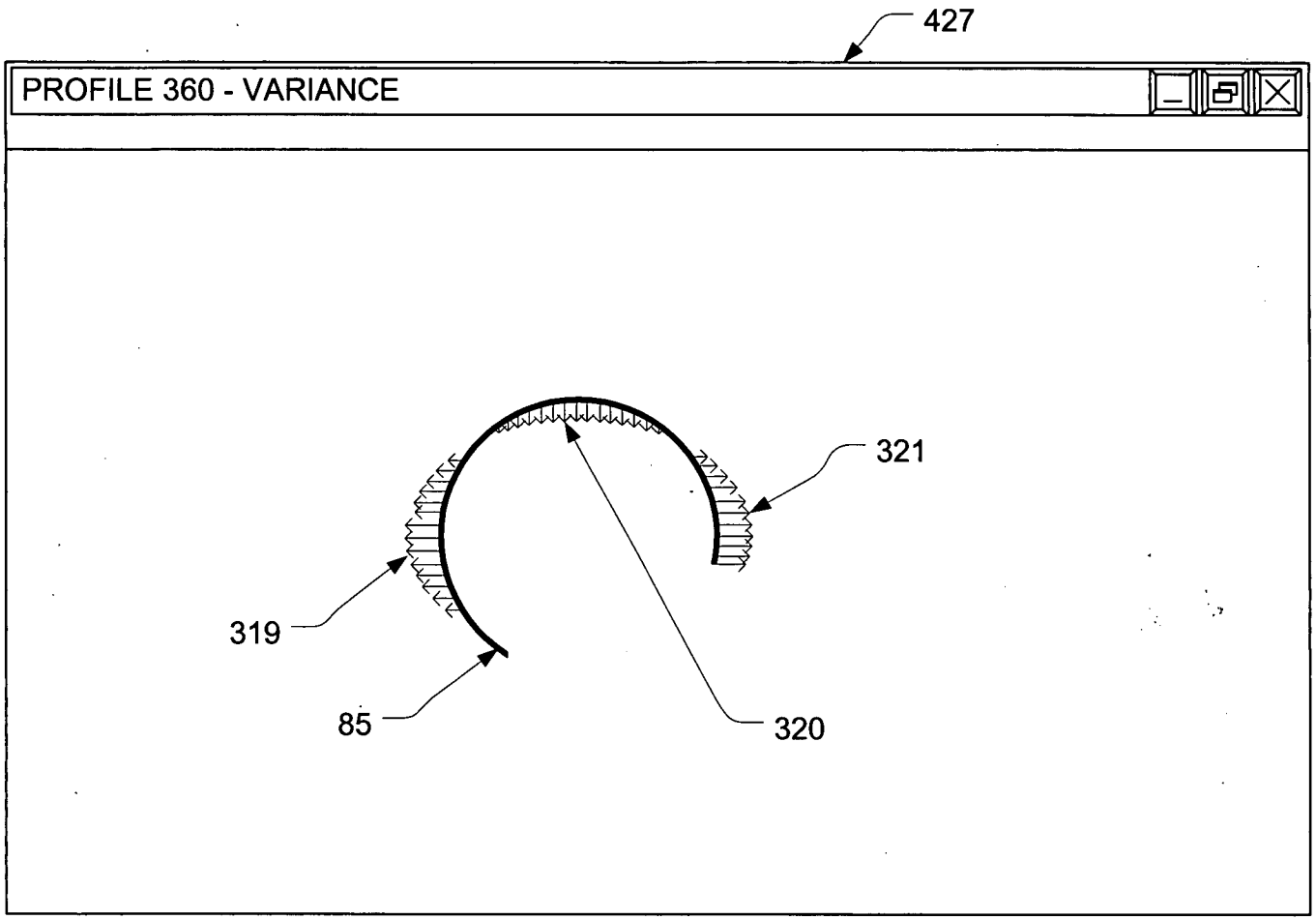


FIG. 3J

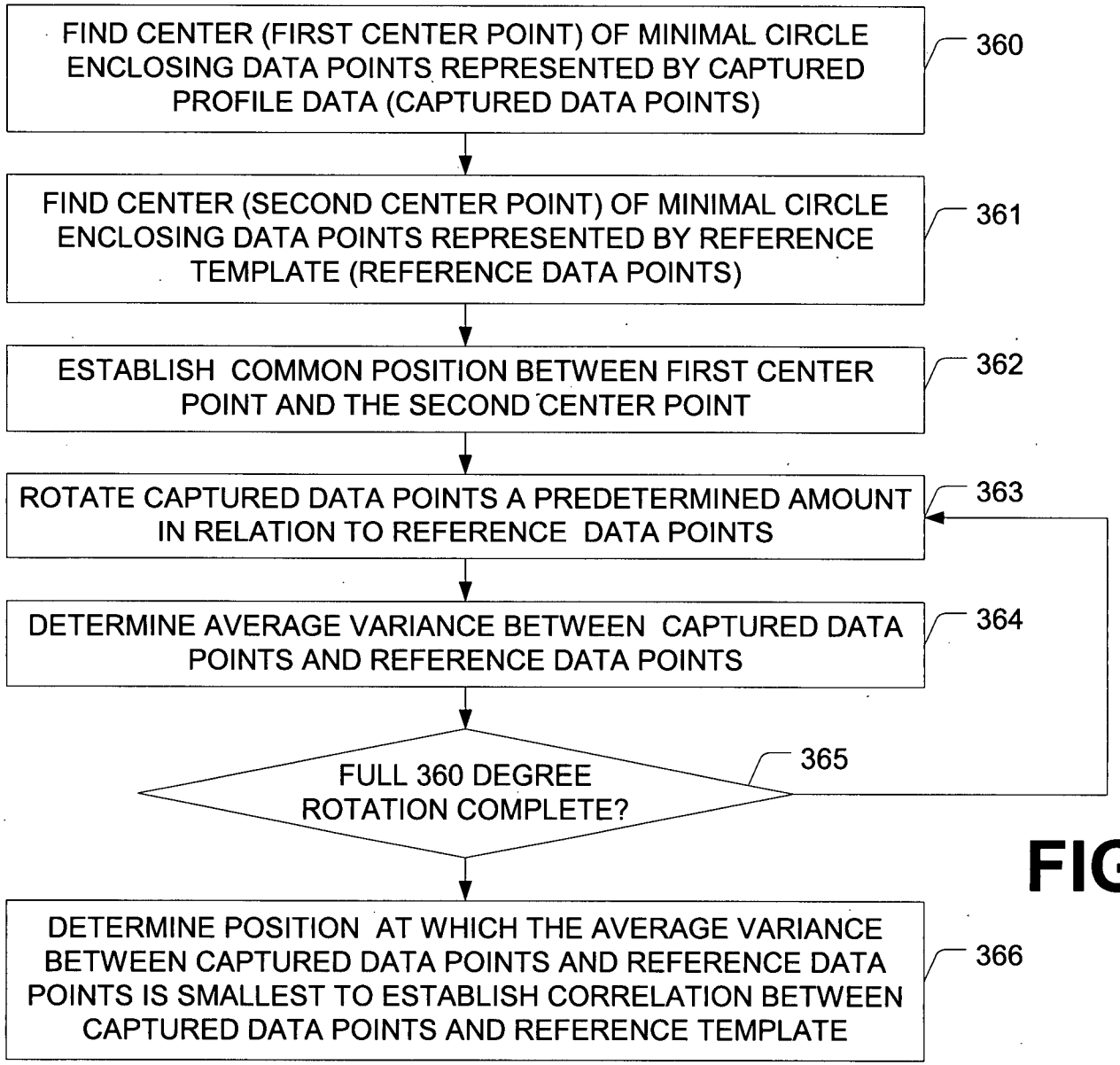

FIND CENTER (FIRST CENTER POINT) OF MINIMAL CIRCLE ENCLOSING DATA POINTS REPRESENTED BY CAPTURED PROFILE DATA (CAPTURED DATA POINTS)
360
FIND CENTER (SECOND CENTER POINT) OF MINIMAL CIRCLE ENCLOSING DATA POINTS REPRESENTED BY REFERENCE TEMPLATE (REFERENCE DATA POINTS)
361
ESTABLISH COMMON POSITION BETWEEN FIRST CENTER POINT AND THE SECOND CENTER POINT
362
ROTATE CAPTURED DATA POINTS A PREDETERMINED AMOUNT IN RELATION TO REFERENCE DATA POINTS
363
DETERMINE AVERAGE VARIANCE BETWEEN CAPTURED DATA POINTS AND REFERENCE DATA POINTS
364
FULL 360 DEGREE ROTATION COMPLETE?
365
DETERMINE POSITION AT WHICH THE AVERAGE VARIANCE BETWEEN CAPTURED DATA POINTS AND REFERENCE DATA POINTS IS SMALLEST TO ESTABLISH CORRELATION BETWEEN CAPTURED DATA POINTS AND REFERENCE TEMPLATE
366

FIG. 3K

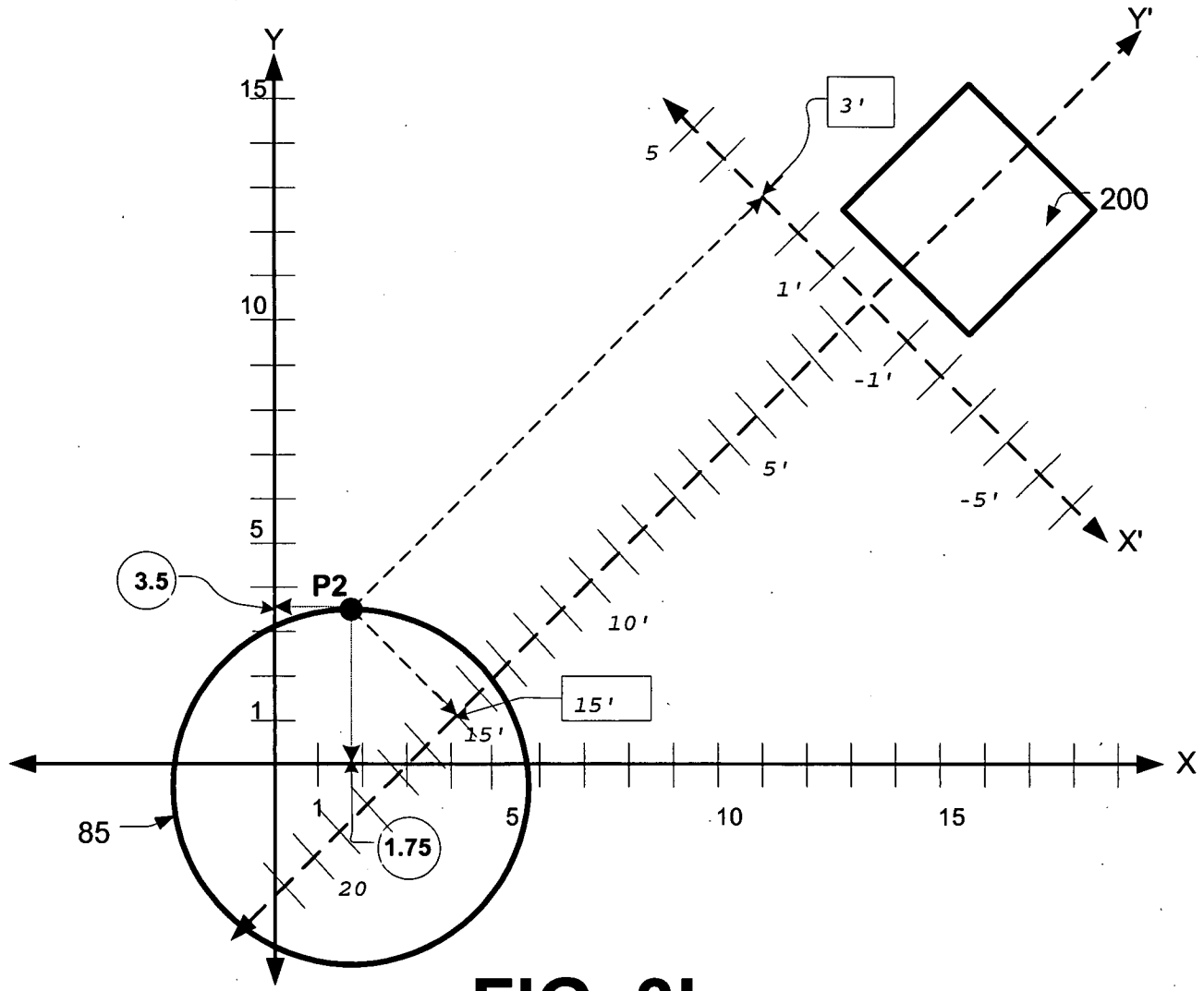


FIG. 3L

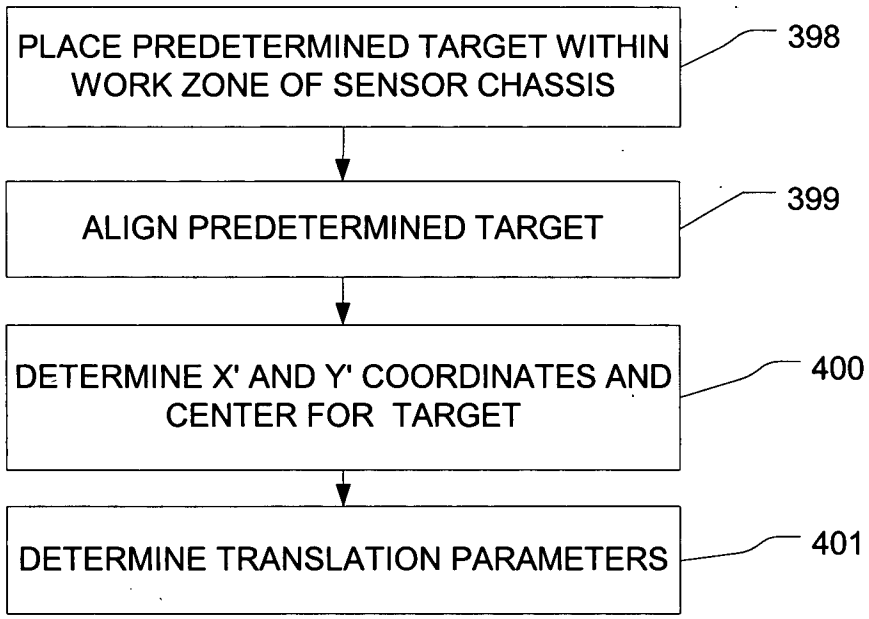

PLACE PREDETERMINED TARGET WITHIN WORK ZONE OF SENSOR CHASSIS
398
ALIGN PREDETERMINED TARGET
399
DETERMINE X' AND Y' COORDINATES AND CENTER FOR TARGET
400
DETERMINE TRANSLATION PARAMETERS
401

FIG. 3M

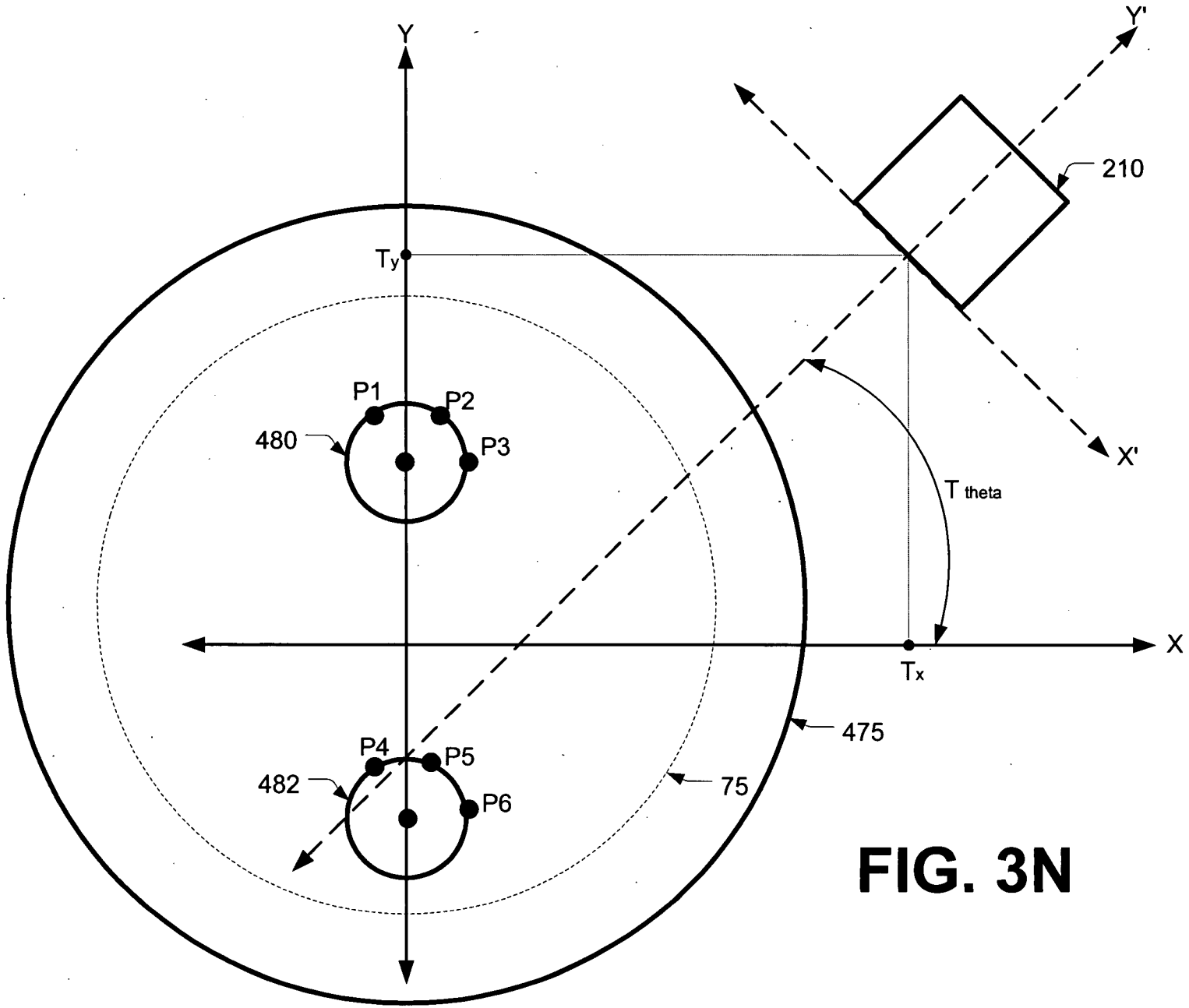


FIG. 3N

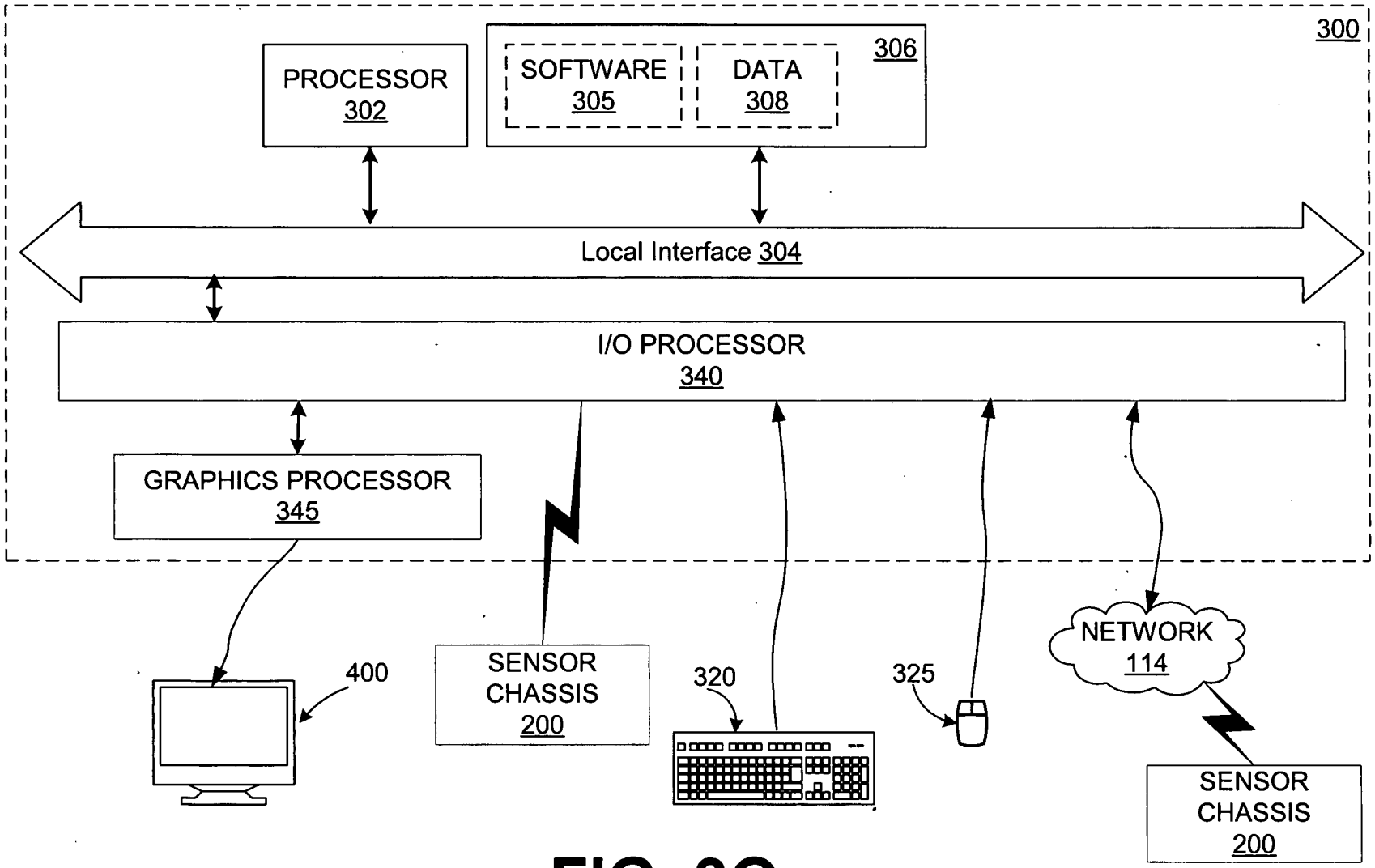
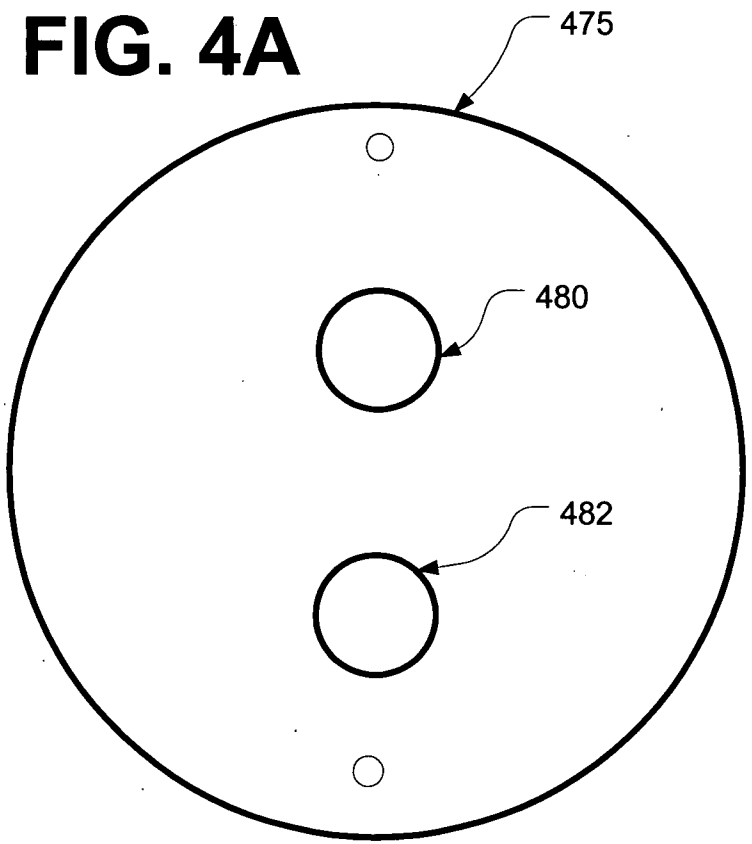

300
PROCESSOR
302
306
SOFTWARE
305
DATA
308
Local Interface 304
I/O PROCESSOR
340
GRAPHICS PROCESSOR
345
400
SENSOR
CHASSIS
200
320
325
NETWORK
114
SENSOR
CHASSIS
200

FIG. 3O

FIG. 4A



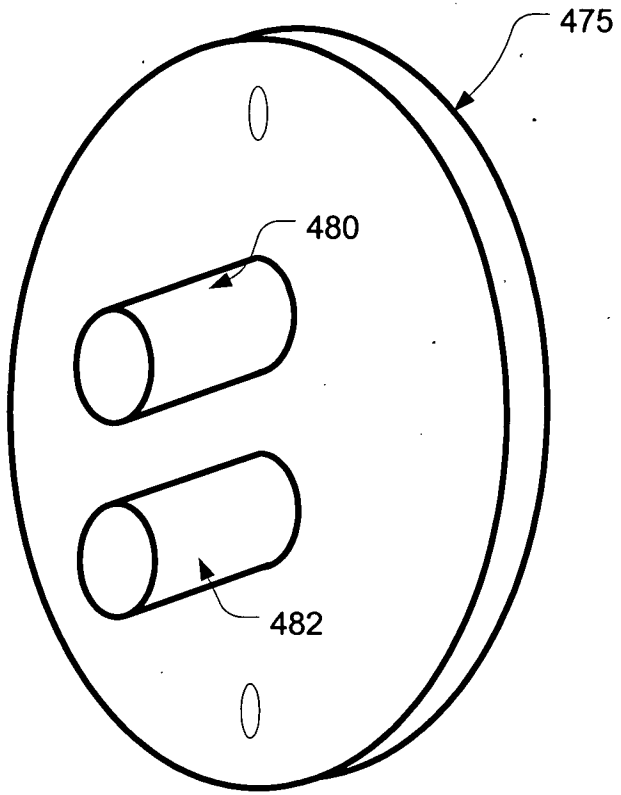


FIG. 4B

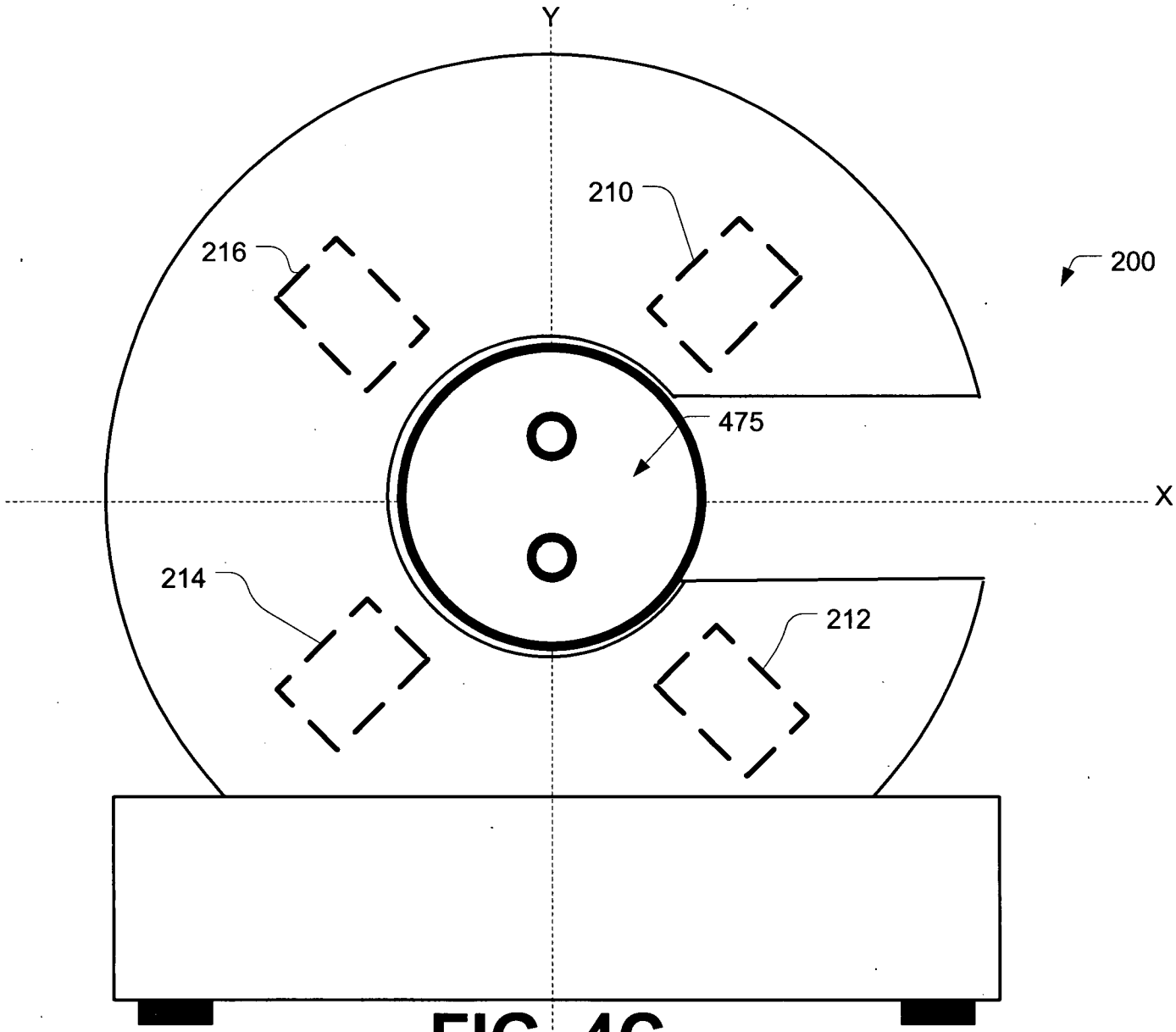


FIG. 4C